RESEARCH PLAN PROPOSAL

AN ENHANCED FRAMEWORK FOR E- COMMERCE APPLICATION SERVICE ON TO THE PUBLIC CLOUD ENVIRONMENT

For registration to the Degree of Doctor of Philosophy

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TOPIC:
An Enhanced Framework for E-Commerce Application Service on to the Public Cloud Environment:

INTRODUCTION:

Electronic commerce, frequently known as e-commerce, has explored a new world before the vendors and customers and has created a bigger virtual marketplace. With the widespread use of Internet, the online business and commercial transactions are now, reached to an extra ordinary height, almost covering more than half of the world. Another rapidly emerging technology, cloud, is one of the most popular choices for the IT industry today. Due to its versatility, storage optimization capacity, performance, 24 x 7 service availability, cloud has created its great impact on the ground of E Commerce.

Electronic Commerce is also known as e-commerce that consists of the purchasing and selling of products or services through electronic systems like computer networks and Internet. In this modern world of technology, e-commerce has become a significant option for many businesses, as there are lot of companies who are interested in developing and maintaining their own stores- online. Further, E-commerce has a number of applications in retail and wholesale. E retailing or on-line retailing is the selling of goods from Business-to-Consumer through electronic stores that are designed using the electronic catalog and shopping cart model. Cybermall such as cybermallghana.com is a single website which offers different products and services at one Internet location. It attracts the customer and the seller into one virtual space through a Web browser.

Basic Categories of E-commerce models are:-

 B2B (Business-to-Business)- Companies doing business with each other such as manufacturers selling to distributors and wholesalers selling to retailers. Pricing is based on quantity of order and is often negotiable. Example: Ferguson.

 B2C (Business-to-Consumer) - Businesses selling to the general customer online using web portal and Software's. Example: Flip cart, Amazon.

 C2B (Consumer-to-Business)- A consumer posts his project with a set budget online and within hours companies review the consumer's requirements and bid on the project. Example: Online job portal like naukri.com or shinejobs.com

 C2C (Consumer-to-Consumer)- There are many sites offering free classifieds, auctions, and forums where individuals can buy and sell thanks to online payment systems like PayPal where people can send and receive money online with ease. Example: Ebay, Olx, magicbricks.com etc.

Many techniques relevant to e commerce plateform have been developed in recent years and are expected to grow more than this. By e-commerce, the exchange of information related to the purchase and sale, required information for the transport of goods with less effort, exchange between banks and customers are now become faster.

E-commerce plateform is advantageous in term of cost savings, increased efficiency, and customization. In order to understand electronic commerce it is important to identify the different terms that are used, and to assess their origin and usage. These include information overload, reliability and security issues, and cost of access, social divisions and difficulties in policing the Internet. A Successful ecommerce plateform involves understanding the limitations and minimizing the negative impact.

With numerous benefits E-commerce has undeniably become an important part of our society. Since web developers have lowered down the prices for their services, it has become more affordable for small businesses to use the world wide web to sell their products. Business have tried to and accommodate to the needs of the consumers.

Cloud computing is a model for convenient and on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management efforts.Cloud Computing is the combination of a technology, platform that provides hosting and storage service on the Internet.The cloud computing is to provide scalable and inexpensive on-demand computing infrastructures with good quality of service levels.

Cloud Computing Service Models

Software as a Service (SaaS): It is also called a delivery model where the software and the data which is associated with is hosted over the cloud environment by third party and that third party is called cloud service provider, like your Gmail account, you use that application on someone else's system.

Platform as a Service (PaaS): In this, you can use Web-based tools to develop applications so they run on systems software which is provided by another company, like Google App Engine.

Infrastructure as a Service (IaaS): It provides services to the companies with computing resources including servers, networking, storage, and data centre space on a pay-per-use basis.

Hardware as a Service (HaaS): It provides hardware as a service as per demand of clients against some pre define parameters.

Deployment models of the Cloud Computing

- Public Cloud: The cloud service policy, value and costing are defined by a service provide and used by general public.
- Community Cloud: The cloud infrastructure is shared by several organizations belonging to a group or community. The infrastructure is hosted by third party of by the community.
- Private Cloud: The cloud model for a single organization and is maintained by organization or third parties.
- Hybrid Cloud: The cloud infrastructure is a combination of two or more cloud models (private, community or public)

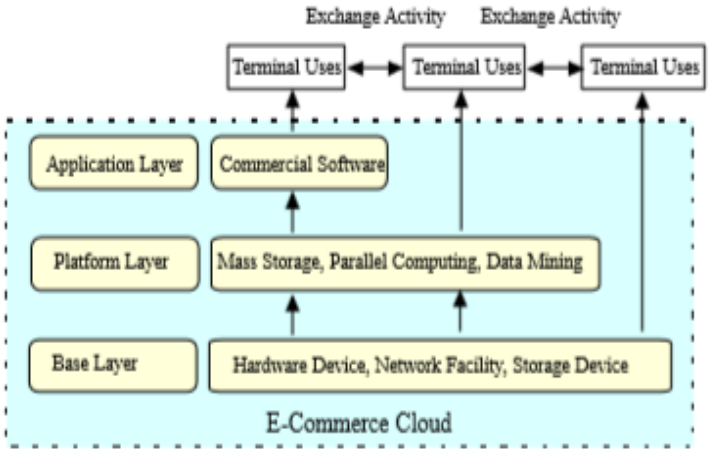
Role of Public Cloud in E commerce :

Public cloud being supportive framework for E –Commerce activities,facilitates huge data backup with scalability With companies such as Amazon Web Services, Google, Microsoft and Rackspace offering the ability to create virtual machines in the cloud to support and replace physical servers, cloud virtualization services are being integrated into data center infrastructures. But knowing which features to consider and which vendors to compare can be a daunting task. In most cases, established organizations with IT resources on-premises should not dispose of existing servers and move everything to the cloud. It would be a waste of money, unless the local resources were scheduled to be retired. Even then, there may be some workloads, such as latency-sensitive ones, that should run locally. Similarly, domain controllers on a public cloud may be infeasible. The best approach is often to treat the cloud as an extension to the organization's existing IT footprint.

There are multiple ways a data center benefits from being extended to the cloud, Few of the benefits of using public cloud with E-commerce framework includes workload scaling and business continuity.There may be times when an organization needs to ramp up their production workload beyond their local data center capacity. Instead servers to accommodate temporary spikes in demand, the companies could use Web-based, it would be relatively easy for cloud-based Web based cloud service through cloud based web server after use, the cloud-based Web servers can be decommissioned.Another advantage of cloud-based Virtual Machines is protecting businesses in case of equipment failures or physical disasters this to provide continutity of any business. To protect against data center failures, some organizations build geographic clusters that span multiple data centers. Then, if a natural disaster destroys an organization's primary data centers, missioncritical workloads fail over to secondary data centers. Building geo-clusters, however, is

expensive and complicated. Therefore Public cloud aids business continuity through Virtual Machine replication. Not every provider or server virtualization platform supports replication, but some cloud and hypervisor combinations allow duplicate Virtual Machines to be created in the cloud and kept in sync with onpremises Virtual Machines. Thus Public cloud allow for flexible and affordable virtual machine deployments and can boost an organization's data backup and workload-scaling capabilities.

Existing E-Commerce application framework on cloud computing:

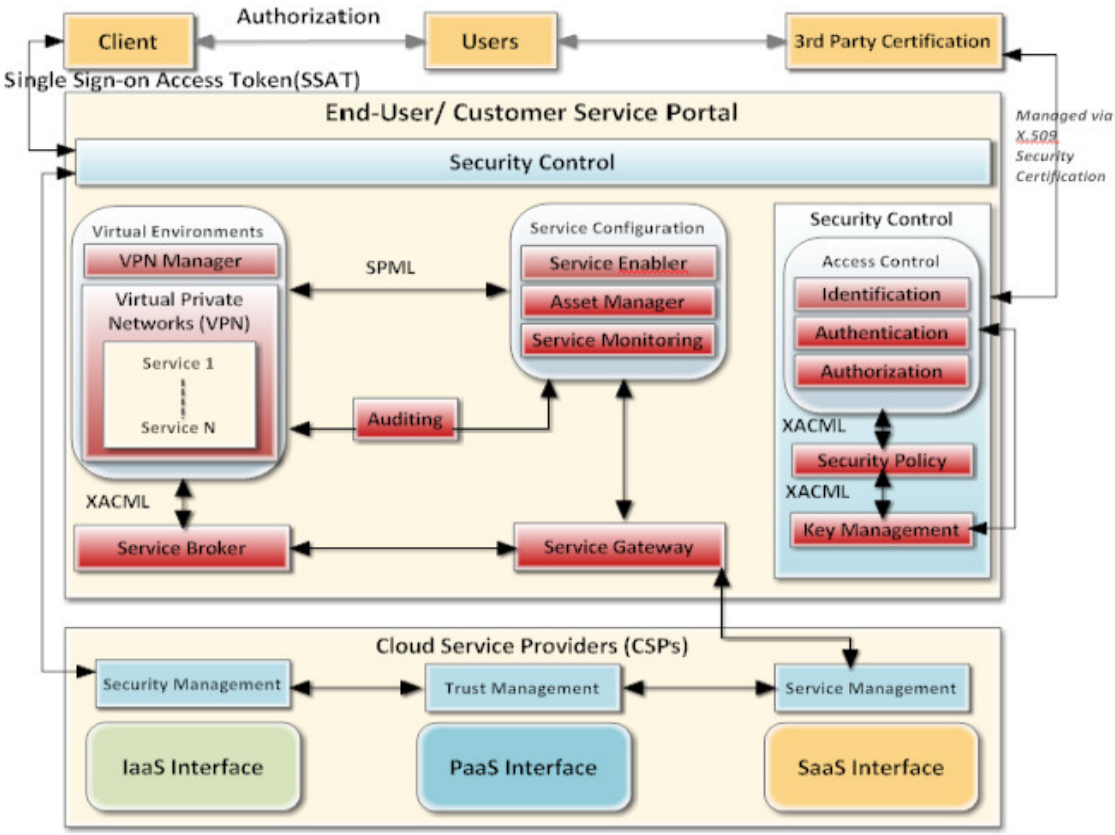


Framework for secure cloud computing is based on the security model shown above which describes the details of each component and apply the needed security technologies for implementation between components in cloud computing. Access control process on each component is as follows:

Client: users could access the client side with multi factors authentication provided by End-User Service Portal. Multi factors authentication based on certification issued by 3rd party certification authority.

End-User Service Portal: when clearance is granted, a single Sign-on access token (SSAT) could be issued using certification of user. Then the access control component share the user information related with security policy and verification with each other components in end-user service portal and cloud service providers by using XACML and KIMP.

Single Sign-on: Users may have multiple accounts on different cloud services with same user name and Password which poses inherent security risks. To overcome this problem, it is suggested that, to streamline security management and implement strong authentication within the cloud.



Service Configuration: The service enabler makes provision for personalized cloud service using user's profile for the integration and interoperation. The SPML can be used to share user's profile. The asset manager requests user's personalized resources with SPML to cloud service provider and configuration service via VPN connection.

Service Gateway, Service Broker: Service gateway manages network resources and VPN on the information life cycle of service broker.

Service Control: The security control component provides significant protection against security threats. Based on the providers access control needs various access control models can be used. Role Based Access Control (RBAC) has been widely accepted as the most promising access control model.

Security Management: Provides the security and privacy specification and enforcement functionality. The authentication and identity management module is responsible for authenticating users and services based on credentials and characteristics.

Trust Management: Due to the cloud's nature i.e. service oriented, the trust level should also be integrated with the service. One possible approach is integrated with service, and bidirectional.

Service monitoring: An automated service monitoring systems to guarantee a high level of service performance and availability.

REVIEW OF LITERATURE

E-Commerce Privacy and Security System "International Journal of Engineering Research and applications, www.ijera.com ISSN: 2248-9622, Vol. 5, Issue 5, (Part -6) May 2015, pp.63-73.

The knowledge of e-commerce privacy and security system prevalent among the users. The responses of people have been represented through graphs and tables on the basis of responses obtained from people. The main feature of the research that the data is safe in banking management for long time and open any account after a long time and . This secure banking system software is access only by the bank (pvt.) and by customer. A customer cannot access the other customer's account in e-bank system. Strong password is used to secure bank account of any customer instead of weak password because strong password is not easily remembered and used. Feedback can be obtained easily as internet is virtual in nature.

Osama Harfoushi1, Bader Alfawwaz2, Nazeeh A. Ghatasheh3,Ruba Obiedat Department of Business Information Technology, King Abdullah II School for Information Technology, The University of Jordan, Amman, Jordan , *Communications and Network*, 2014.

The cloud computing have three layers of services over the cloud that are software as a service (SaaS), Platform as a Service (PaaS),and Infrastructure as a Service (IaaS). Cloud computing has many advantages such as flexibility, efficiency, scalability, integration, and capital reduction. It provides an advanced virtual space for organizations to deploy their applications or run their operations. With disregard to the possible benefits of cloud computing services, the organizations are reluctant to invest in cloud computing mainly due to security concerns. The trend of having cloud services as part of an organization seems to be gaining more importance. Especially in this era the cycle of introducing more technological innovations is getting shorter. For many reasons, including the reduction of capital expenditures, organizations need to consider utilizing cloud services as an essential part of their foundations. In cloud services many issues need to be enhanced in a way ensuring high level of security, confidentiality, authenticity, integration, agility, scalability and trust. The need of standardizing the security issue, possibly by adopting a well formulated security standard. Accordingly, a proposed solution in suggests implementing standardized API's, which makes switching between clouds or services easier.

Impacts of Cloud Computing on E-Commerce Businesses In India", International Journal of Advance Research In Science And Engineering (April 2015)

E-commerce in Small and medium enterprises (SME's) is need to serve the customers a good services to satisfy their customers and give them good profits. These enterprises faced many issues and challenges in their business like lake of resources, security and high implementation cost and so on. The benefits can be serve by cloud computing and the issues and challenges that E-commerce Small and medium enterprises (SME's) faced, and how cloud computing can solve these issues.

The cost: Ecommerce SME's need to high implement cost to give good services to their customers and to support the organization business implementation Lack of technology and technical people E-commerce services need high performance of hardware, Services, and software to give good typical services to the Customers and to avoid the competitive pressure with the other enterprises.

The security: The customer data, such as recent purchase, income, address, credit card number, credit history and other personal information that are collected electronically by SMEs via Internet web enabled cookies and sometimes spyware. Spyware enables an individual or a company to monitor and gather information on the activity of a computer user that raises some privacy and security issues.

Availability: The availability needs a business process, working practice, the management of change, and the need to evolve new ways of thinking, behaving and organizing. Cloud computing and E-commerce previous study have been done by many researchers to give illustration about the cloud technology and E-commerce by many perspectives and the issues that may face the E-commerce SME's implementation among E-commerce small and medium enterprises.

Cloud Computing: Security Issues and Research Challenges, IRACST - International Journal of Computer Science and Information Technology & Security Vol. 1, No. 2, 136-145, December 2011.

Cloud service providers need to inform their customers on the level of security that they provide on their cloud. First discussed various models of cloud computing, security issues and research challenges in cloud computing. Data security is major issue for Cloud Computing. There are several other security challenges including security aspects of network and virtualization. This paper has highlighted all these issues of cloud computing. We believe that due to the complexity of the cloud, it will be difficult to

achieve end-to-end security. New security techniques need to be developed and older security techniques needed to be radically tweaked to be able to work with the clouds architecture.

Secure Framework for Data Storage from Single to Multi clouds in Cloud Networking", International Journal of Emerging Trends & Technology in Computer Science (IJETTCS) April 2013.

The use of cloud computing has increased rapidly in many organizations. Cloud providers should address privacy and security issues as a matter of high and urgent priority. Dealing with "single cloud" providers is becoming less popular with customers due to potential problems such as service availability failure and the possibility that there are malicious insiders in the single cloud. In recent years, there has been a move towards "multi-clouds", "inter cloud" or "cloud-of-clouds".

This paper focuses on the issues related to the data security aspect of cloud computing. As data and information will be shared with a third party, cloud computing users want to avoid an un trusted cloud provider. Protecting private and important information, such as credit card details or a patient's medical records from attackers or malicious insiders is of critical importance.

Survey of Security Issues in Cloud based E-Commerce International Journal of Advanced Research in Computer science May- 2017

E-business security policy which is based on cloud computing platform must take full account of the User, e-commerce companies, cloud computing service providers, network operators, third party Certification bodies and other parties who are interested, in order to ensure security of e-commerce operations. It must also solve four ecommerce security risks – storage of information and data security issue, cloud computing service providers and other scientific issues. Simultaneous, promoting e-commerce standard using the cloud computing platform, by improving the relevant laws and regulations, using the legal system leading to sustainable development. E-commerce platform which is based on the Cloud Computing solves the four types of E-Commerce Security Risks.

E-Commerce Platform Based on Cloud Computing Solves Scientific Service Provider Selection:

Before building e-commerce platform based on cloud computing, e-commerce businesses should be based on their own needs to choose a larger and better cloud computing service providers, asked in

detail about the data stored, recognition in the event of termination of the cloud computing services or service provider acquired by another company in such circumstances, their data will not be affected.

Limitation of Current Solutions :

The traditional solution to ensure data confidentiality by data encryption is not sufficient due to the fact that the user's data needs to be manipulated in the virtual machines of cloud providers which cannot happen if the data has been encrypted. Administrators manage the infrastructure and as they have remote access to servers, if the administrator is a malicious insider, then he can gain access to the user's data. We present some negative aspects of data encryption. in cloud computing. In addition, they assume that if the data is processed from different clients, data encryption cannot ensure privacy in the cloud. we aim to provide a framework to supply a secure cloud database that will guarantee to prevent security risks facing the cloud computing community. This framework will apply multi -clouds and the secret sharing algorithm to reduce the risk of data intrusion and the loss of service availability in the cloud and ensure data integrity. In relation to data intrusion and data integrity, assume we want to distribute the data into three different cloud providers, and we apply the secret sharing algorithm on the stored data in the cloud provider. An intruder needs to retrieve at least three values to be able to find out the real value that we want to hide from the intruder. This depends on Shamir's secret sharing algorithm with a polynomial function technique which claims that even with full knowledge of (k – 1) clouds, the service provider will not have any knowledge of (vs is the secret value). Regarding service availability risk or loss of data, if we replicate the data into different cloud providers, we could argue that the data loss risk will be reduced. If one cloud provider fails, we can still access our data live in other cloud providers. This fact has been discovered from this survey and we will explore dealing with different cloud.

The recent research on single clouds and multi clouds to address the security risks and solutions. We have found that much research has been done to ensure the security of the single cloud and cloud storage whereas multi-clouds have received less attention in the area of security. We support the migration to multi-clouds due to its ability to decrease security risks that affect the cloud computing user provider interfaces and the network traffic between cloud providers.

MOTIVATION TO THE WORK:

- Cloud computing is gaining popularity in IT industry, due to its flexibility, scalability and attractive *pay-per-use* business model.

- The aim of this study is to investigate the behavioral intention of E-commerce SME's to use or not cloud computing technology among E-commerce enterprises
- Much of research in cloud computing has concentrated on technical issues such as designing, deployment, performance and interface requirements. The research within the organizational studies is rare.
- Most of the companies are facing challenges during adaptation of cloud-based solutions, especially in terms of security issues on application models in cloud.
- It is difficult to discover the complex dependencies of applications on the underlying IT environment.
- Lack of a systematic process to guide project managers and application developers in making informed cloud models selections.
- There are no comprehensive guidelines for designing, developing and deploying solutions for migrating software systems to cloud computing.
- All the above mentioned papers directly or indirectly identify the need for more case studies in cloud model and e commerce model security field. The case studies which cloud help the cloud provider to identify the changes to be done during.

OBJECTIVE:

Objective functions aims to enhance E-commerce application framework on to the cloud.

- To analyze the problem faced in E-Commerce services on to the cloud environment.
- To minimize the cost of E-commerce services onto the cloud environment.
- To minimize the processing time of deployment of E commerce application services.
- To design and improved framework on E-Commerce application in Cloud environment.

RESEARCH METHODOLOGY

- Data collection: Primary data is a type of data which never existed before. As Primary data is collected for a specific purpose, i.e. they are critically analyzed to find answers to research question(s). During the proposed study we will try to collect primary data from various Cloud providers' officials.

  Secondary data, on the other hand, refers to a type of data that has been previously published in journals, magazines, newspapers, books, online portals and other sources. In phase I, in addition to primary data collection, we will try to compare the extensively available secondary data stored in form of relevant theory and frameworks regarding e commerce environment on cloud.

- Data Analysis: In phase II, data collected in the first phase will be used for data analysis. Various Simulation tests will be used to analyze the problem faced by existing E-Commerce services and also to analyze limitations and boundaries on existing E-commerce service frameworks. As we know Cost and processing time are crucial factors for success of any e-commerce service. Thus, during the proposed study we will also study these two constraints.
- Designing of new improved framework: In phase III, The results of the second phase will be used to design the new improved framework by eliminating the weaknesses of the current cloud e-commerce services.

WORK PLAN:

- For the first 5-6 Months: Primary Data Collection.
- For the next 5-6 Months: Secondary Data collection
- For the next 5-6 Months: Data Analysis by simulation
- For the next 5-6Months: Designing of a new framework.
- For the next 5-6 Months: Evaluation and Thesis Designing

PLACE OF WORK AND FACILITIES AVAILABLE

The research work will be undertaken with the help of online tools and cloud applications. The Case Study and Interviews would be conducted on personal basis or through social network sites like LinkedIn, Facebook etc.

LIMITATIONS & ALTERNATIVE PLAN OF THE STUDY

Some tools and consultation may be required for the research work. With the help of university resources, workshops and online learning these limitations could be overcome.

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